species as *Adiantum pedatum*, *Thuja occidentalis*, *Lilium canadense*, *Calypso bulbosa*, *Lonicera canadensis*, *Solidago squarrosa*, *Aster macrophyllus*, and many other similar plants not found in Newfoundland, and which in eastern Canada "scrupulously avoid the more sterile areas." This explanation and the considerable lists of "calciphiles" indicate that the writer believes the vegetation to respond directly to the chemical character of the substratum.—GEO. D. FULLER.

Root tubercles of cycads.—Three papers on root tubercles of cycads, recording conflicting opinions, lay emphasis upon different features of these rather well known structures. ZACH[35] pays particular attention to the fungus hyphae, which branch profusely and become coiled together, after which the coils become digested. The fungus infests the tissues, causing the abnormal development, and the cell reacts by absorbing the fungus, a phenomenon which reminds the author of phagocytosis in animals. The relation is not symbiosis, but parasitism.

HOŘEJŠI[36] comes to the conclusion that the relation is symbiosis, and that the alga is the only cause of the abnormalities in the roots, the fungi and bacteria being merely the accompaniments of degeneration. The alga enters by the lenticels.

The third paper, by Miss SPRATT,[37] deals entirely with the life history of the alga, and gives a much more detailed account than has hitherto been available. She finds that the heterocysts are reproductive bodies, the contents of which break up into gonidia capable of reproducing the filament, as described by BRAND for *Nostoc*. The central body is described as a simple structure, incapable of anything but direct division. No reference is made to the work of OLIVE, whose technic and figures might have been helpful.

None of the three writers refer to the work of LIFE,[38] who described the mode of entrance of the alga and the general development of the root tubercle. —CHARLES J. CHAMBERLAIN.

Cretaceous flora of Japan.—SUZUKI[39] has described two conifers from the Upper Cretaceous of Japan as new. One of them is made the basis of a new genus (*Abiocaulis*), and is said to be nearest to *Abies* among living forms;

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[35] ZACH, FRANZ, Studie über Phagocytose in den Wurzelknöllchen der Cycadeen. Oesterr. Bot. Zeit. **60**:49–55. *pls. 2.* 1910.

[36] HOŘESJSI, J., Einiges über die symbiontische Alga in den Wurzeln von *Cycas revoluta*. Bull. Intern. Acad. Sci. Bohême **15**:1–10. *figs. 24.* 1910.

[37] SPRATT, ETHEL ROSE, Some observations on the life history of *Anabaena Cycadeae*. Ann. Botany **25**:369–380. *pl. 32.* 1911.

[38] BOT. GAZ. **31**:265–271. 1901.

[39] SUZUKI, Y., On the structure and affinities of two new conifers and a new fungus from the Upper Cretaceous of Hokkaido (Yezo). Bot. Mag. Tokyo **24**:181–196. *pl. 7.* 1910.

the other is a new species of *Cryptomeriopsis*, the generic name suggesting the reputed affinity. A new fungus is also described, parasitic on the shoots of *Cryptomeriopsis*, and is referred to the Pyrenomycetes as a new genus (*Pleosporites*).

FUJII[40] has followed SUZUKI'S paper with a short discussion of the features of the cretaceous flora of Japan so far as uncovered, and especially contrasting it with the results of HOLLICK and JEFFREY in the United States. He announces a change of opinion as to the affinities of *Yezostrobus* and *Yezonia* (STOPES and FUJII 1910), being convinced now that this strobilus and stem, whether they belong together or not, are to be associated with the araucarians. The discussion of the causes of extinction is preliminary and suggestive rather then definite, attention being called to the influence of such factors as parasitic fungi, injurious gases from volcanoes, climatic changes, "inherent characters," etc. Even the cytological situation is included, the fluctuating numbers of chromosomes in angiosperms and their fixed number in gymnosperms suggesting a relation to the variability and hence adaptability of the former group, and the fixity and decadence of the latter group.—J. M. C.

An ecologist's garden.—A botanical garden of a new type, situated on Mount Aigoual, a peak of the Cevennes, and due largely to the foresight and energy of Professor FLAHAULT, has recently been described by SKENE.[41] The situation seems almost ideal for the study of many ecological problems, as it lies between the Atlantic and Mediterranean basins, with an elevation that permits the mesophytic vegetation of the former to thrive within a few miles of the xerophytic plants of the latter region. The presence and proximity of calcareous, siliceous, and granitic soils add to the value of the region for experimental purposes. In addition to the garden proper (800 feet below the summit), there is a plot at the very top of the mountain, and a bog which forms the source of a stream.

Since the founding of the garden (known as "L'Hort de Dieu") in 1903, a laboratory capable of sheltering a dozen people has been erected, and several thousand seedling trees and shrubs have been planted. Trees from all parts of the earth are being grown, in order to find those most suitable for forestry purposes in southern France, and to solve such ecological problems as the factors which limit tree species at certain altitudes. Not only the garden but the entire mountain is being made one gigantic ecological experimental plot.—GEO. D. FULLER.

Leaves of Calamites.—THOMAS[42] has undertaken an investigation of the leaves of certain species of *Calamites*, to obtain from their structure indications

[40] FUJII, K., Some remarks on the cretaceous fossil flora and the causes of extinction. Bot. Mag. Tokyo **24**:197–220. 1910.

[41] SKENE, MACGREGOR, An ecologist's garden. New Phytol. **10**:64–68. 1911.

[42] THOMAS, H. HAMSHAW, On the leaves of *Calamites* (CALAMOCLADUS section). Phil. Trans. Roy. Soc. London B **202**:51–92. *pls. 3–5*. 1911.